Blue River Compact (BBRC) Annual Meeting
Blue River Compact Report - Upper Big Blue NRD (UBBNRD)
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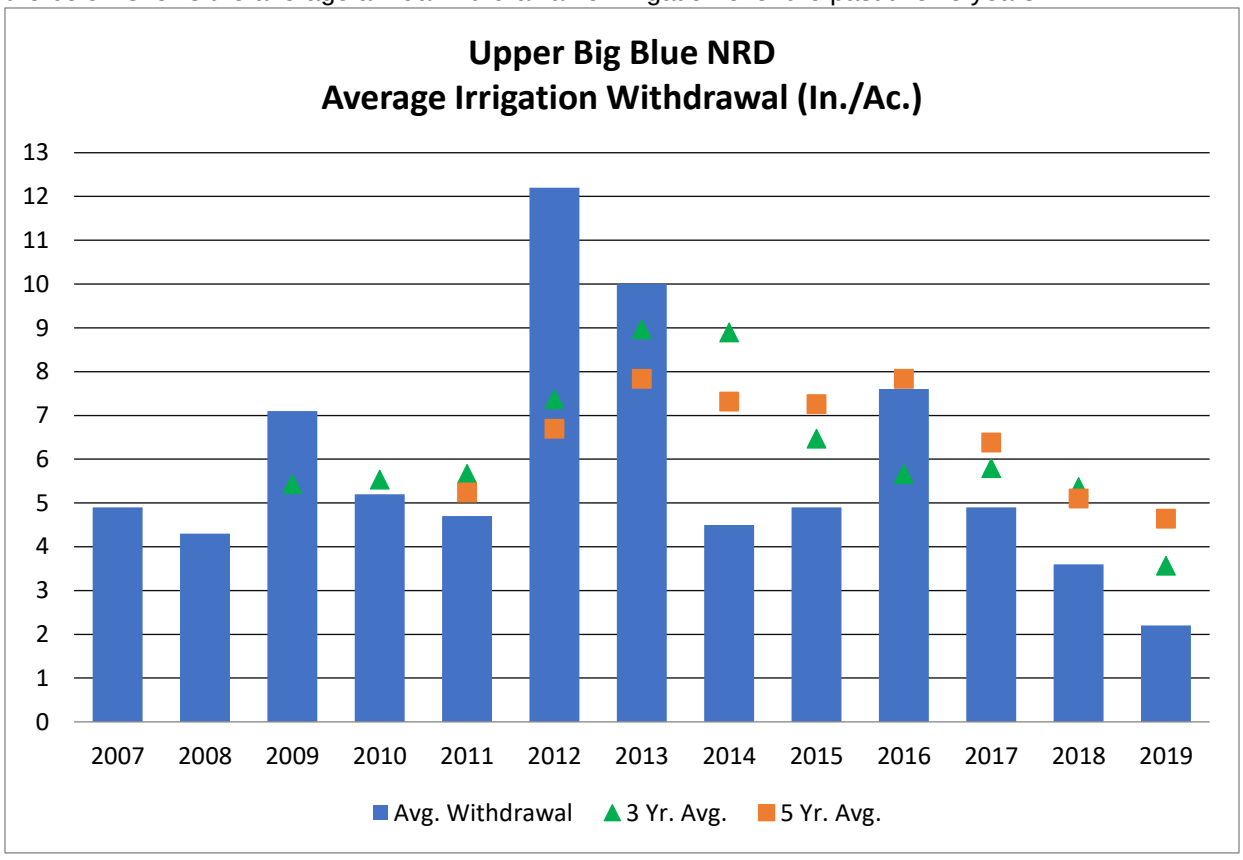
**Well Drilling Activities**
Fifty-five permits were issued for irrigation wells (44 new & 11 replacements) during the 2019 calendar year. In January 2020, there were 12,212 irrigation wells in the District.

**Groundwater Level Changes**
The average groundwater level change for the District from spring 2019 to spring 2020 was a rise of 3.67 feet. The spring 2020 groundwater level is 8.78 feet above the District's allocation trigger level.

**Certified Irrigated Acres**
Mandatory reporting of irrigated acres and other water uses began in 2006. As of January 1, 2020, there were 1,240,476 groundwater irrigated acres certified by the NRD. This represents an increase of 1,114 acres since January 1, 2019.

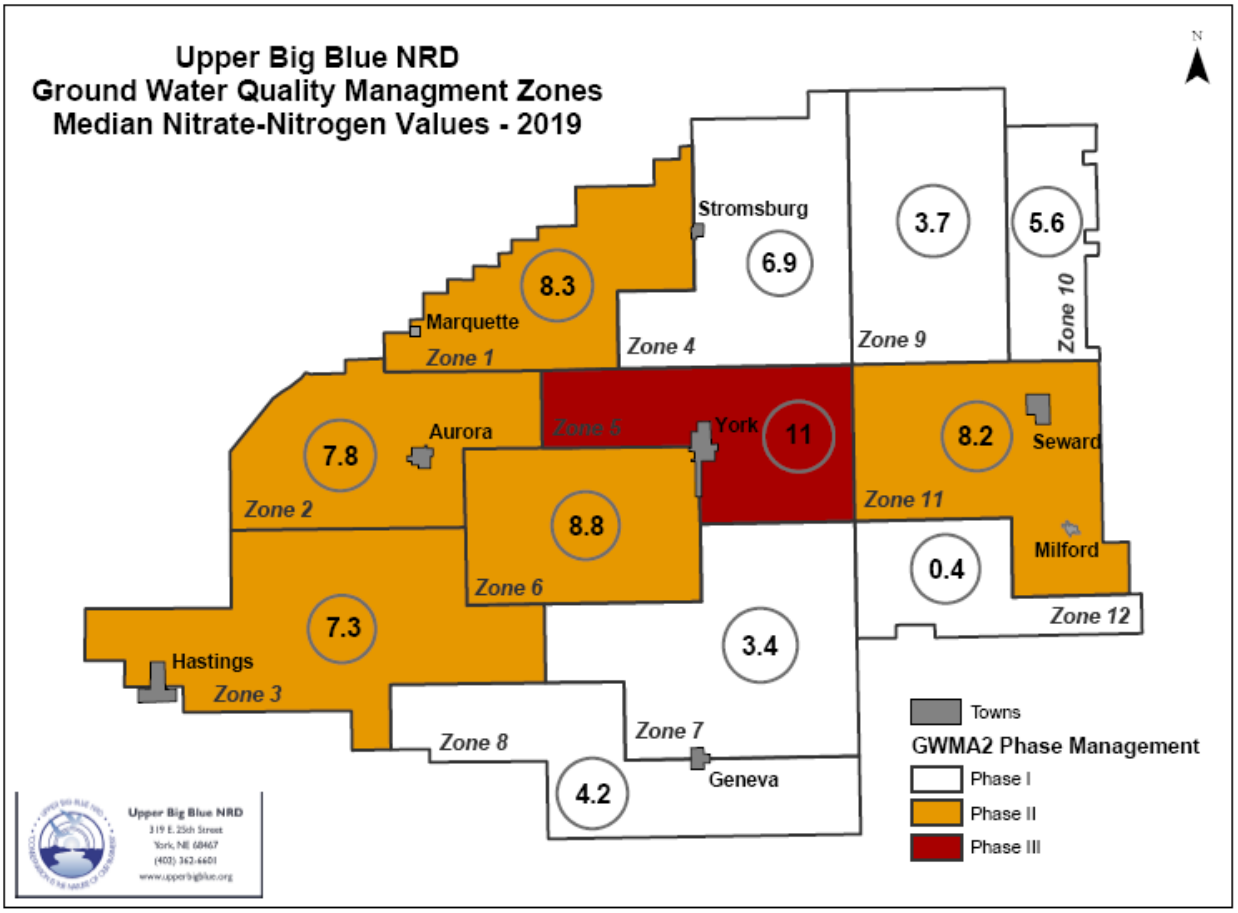
**Groundwater Withdrawal**
Mandatory reporting of groundwater withdrawal began in 2007. 2019 was the 12th year that groundwater withdrawal reports were required in the District. Metering became mandatory on all wells effective January 1, 2016. Staff has inventoried all flowmeter installations and are now conducting routine inspections as needed. The average groundwater withdrawal for irrigation in 2019 was 2.2 inches per acre. The graph to the below shows the average annual withdrawal for irrigation over the past twelve years.



**Groundwater Quality**

*Nitrate*

The District is divided into twelve management zones for groundwater quality management. The primary groundwater quality management concern is nitrate. Five zones are currently designated Phase II Management Area and one (Zone 5) is designated a Phase III Management Area. Phase II & III Management Areas requires farm operators to attend a training session on best management practices related to fertilizer and irrigation management. It also requires deep soil sampling, irrigation scheduling and annual BMP reports. Farm operators in phase II & III must schedule irrigation using soil moisture sensors in at least one field. In a Phase III Management Zone anhydrous ammonia fertilizer applied from November 1st through February 29th must include a nitrification inhibitor. The timing of application of nitrogen fertilizers is restricted District wide. There are currently over 1,000 farm operators in the District required to attend nitrogen management training. The District is also working with the City of Hastings and the Little Blue NRD on a special water quality management area to address nitrate contamination in the Hastings Wellhead Protection Area.




*Arsenic, Selenium and Uranium*

Natural groundwater contaminants such as arsenic, selenium and uranium occur in many areas. These chemicals are associated with sediments in the aquifer as well as the unsaturated zone above the aquifer. Recent groundwater quality investigations near Hastings, Nebraska as well as other parts of the mid-west indicate that these naturally occurring contaminants may be released into the groundwater as a result of increased agriculture chemical contamination such as nitrate. The District is working with the University of Nebraska to develop a monitoring program for arsenic, selenium and uranium.

*Dakota Aquifer*

In 2016 the District started a water sampling program for the Dakota aquifer. The Dakota is used in the eastern part of the District for domestic wells where other sources are very limited. High commodity prices and drought conditions in 2012 and 2013 prompted construction of irrigation wells in the Dakota. Concerns have been raised over the impact that Dakota aquifer irrigation wells may have on the domestic groundwater supply. The quality of water in the Dakota can be "hit and miss" as to suitability for domestic and irrigation uses. It is unclear to what degree further development of the aquifer could impact water quality or domestic supplies to existing wells.

**Project Grow**

Project GROW is a collaborative demonstration project between the City of York and the UBBNRD. It focuses on three areas of interest: a soil health demonstration, an awareness of the importance of pollinator habitat and a community garden for the citizens of York. The District is farming 140 acres of the City wellfield with a rotation of cover crops to promote soil health. This is the third growing season of the project. The District received initial funding from the NACD. A second round of funding from a Nebraska Department of Environment and Energy Source Water Protection Grant provides financial assistance to continue educational efforts surrounding Project GROW.

**The Nature Conservancy Cover Crop Interseeding Project**

The UBBNRD was in early discussions with the University of Nebraska Extension (UNL Extension) on a possible cover crop interseeding demonstration when the District was approached by The Nature Conservancy to partner on a project demonstrating soil health/sustainable agriculture practices. The Nature Conservancy came on board with the District and UNL Extension to begin demonstrating the use of interseeded cover crops to improve soil organic matter, increase water infiltration, provide weed suppression, and to improve overall soil health. In 2020, eleven producers are participating in this demonstration. This is a three-year project with a possible two-year extension.

**Nebraska Agricultural Water Management Demonstration Network**

This program encourages producers to improve irrigation scheduling using Etgages and Watermark sensors to determine crop water needs. The Etgage simulates crop water use through evaporation through a ceramic and green canvas membrane. Watermark sensors are used to measure soil moisture in a nearby field to confirm the ETgage's accuracy. This program began in the UBBNRD in 2005 with a collaborative effort with the University of Nebraska Extension and 18 collaborators. The program is now being implemented in several NRDs and with over 2,000 collaborators. The District sells this equipment to irrigators at a reduced cost to encourage adoption of irrigation scheduling practices.

**Soil and Water Conservation Cost-share Assistance**

Through the District's Land Treatment Program, the District funded 31 soil and water conservation projects with a total cost share of $123,389.24 in FY2019. Funded projects included terraces, sediment control basins, waterways, pasture plantings, and tree plantings for windbreaks & enhancing wildlife. Funding sources for the Land Treatment Program included $71,667.20 from the Nebraska Soil and Water Conservation Program and $51,722.04 from local NRD property tax revenues. This was an approximate 35% decrease in projects from FY2018, primarily due to the weather conditions. Projects have increased in FY2020.

**Nebraska Buffer Strip Program**

Through the Nebraska Department of Agriculture, the District administers the Nebraska Buffer Strip Program. This program provides cost share funds for landowners to establish vegetative buffer strips along shorelines of wetlands, streams, and lakes. Funding comes from a fee assessed on all pesticides registered for use in Nebraska. In FY19 the District administered 21 buffer strip contracts which provided a total cost share of $24,155.45.

**Variable Rate Irrigation Pilot Program**
The District began a Variable Rate Irrigation Pilot Program in 2017. With over 10,000 center pivots the District believes that VRI can have a significant impact water use efficiency and may provide water savings. In FY2019 the District funded 6 VRI projects with a total District contribution of $16,296.52. Though the first 3 years of this program the District has funded 15 VRI projects with a total cost share of $41,637.51 (average cost share of $2,775.83). These 15 VRI systems are speed control, with funding provided for panel upgrades, EC mapping, variable frequency drives, and prescriptions.

**Private Dams Program**
Through District's Private Dams Program, the District provides planning, design, and financial assistance for the construction or reconstruction of dams located on private property. In FY2019 the District provided cost share assistance for 2 dams with a total $18,307.95 of District funds. Construction of 2 larger dams were delayed and will be completed in FY2020. Through the first three years of the program, the District has provided assistance for 13 dams with an average cost share of $18,000 per dam.

**Wetlands Grazing - Rawhide Portable Corral**
The Rainwater Basin Joint Venture purchased three Rawhide Portable Corrals through a grant from the Nebraska Environmental Trust. These corrals will be available for use free charge for cattle producers that graze wetlands. The three corrals will be housed at the Upper Big Blue NRD, the Little Blue NRD, and the Tri-Basin NRD. Controlled grazing of these wetlands provides a more natural way to manage the ecosystem by providing more diverse plant communities and reducing the use chemical treatments or other mechanical methods to manage these areas. The Upper Big Blue NRD received the corral in late August and it was loaned out the day after it arrived. Two local cattle producers used the corral at four wetland grazing sites during the last week of August. The Upper Big Blue NRD is planning on hosting a field day later this fall to demonstrate the use of the corral.

**Divots in the Pivots**
The District received a Regional Conservation Partnership Program (RCPP) grant through NRCS. Divots in the Pivots provides a variety of cost-share assistance to landowners with wetlands in the Rainwater Basin to conserve that wetland while improving profitability of the farming operation. VRI, fencing, livestock watering and conservation easements are few of the many options available. The Rainwater Basin Joint Venture is the major partner in this effort. Currently, there are three cooperators in this program. One in each of the Little Blue NRD, Tri-Basin NRD and Upper Big Blue NRD.

**Groundwater Modeling**
The District, in cooperation with the Lower Big Blue, Little Blue, Tri-Basin NRDs and the Department of Natural Resources are partnering in the development of a transient Blue Basin Groundwater Model that can not only answer the question of interconnection between surface and groundwater, but other management questions NRDs ask when reviewing their groundwater management plans. These efforts are well underway and final product delivery is slated for December 2020.

**Wellhead Protection Planning**
The District continues to assist communities to develop Wellhead Protection Area (WHP Area) Plans. The District also assists communities with implementation of some plan components. These include water sample collection and analysis from rural wells and soil samples collected from the unsaturated zone for nitrates.

**Water Quality Management Plan**

The Water Quality Management Plan (WQMP) has been accepted by Environmental Protection Agency (EPA). Two Priority Areas were defined in the plan: Recharge Lake impairment for Mercury and Beaver Creek for E. Coli and Atrazine. Once the plan is accepted by the UBBNRD Board of Directors, District staff will begin Phase I of the Water Quality Management Planning process by forming a stakeholder group comprised of landowners and other interests from both the Recharge Lake and Beaver Creek watersheds. This stakeholder group will identify conservation practices that landowners/operators would be willing to implement to address the impairments in both priority areas. Phase II of the planning effort will utilize recommendations and feedback from the stakeholder group to develop a more robust program to get conservation practices on the ground in both priority areas. The District hopes to secure 319 funding for both the Phase I (Stakeholder involvement) and Phase II (Conservation practice implementation projects).

**Voluntary Integrated Management Planning**

The stakeholder group formed for the WQMP also provided recommendations for the District's Voluntary Integrated Management Plan (VIMP). The VIMP will look at the relationship between ground and surface water uses in the District. The District is working with the Nebraska Department of Natural Resources to develop the VIMP. Current efforts include working on a basin groundwater model that will provide updated information on hydrologically connected areas.

**Visit our Website**

You can learn all about the District's programs and activities at www.upperbigblue.org.